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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/760,529	01/21/2004	Hugh M.L. Watson	118409	1112
25944	7590	11/02/2007		
OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850			EXAMINER RAMDHANIE, BOBBY	
			ART UNIT 1797	PAPER NUMBER
			MAIL DATE 11/02/2007	DELIVERY MODE PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/760,529	<b>Applicant(s)</b> WATSON ET AL.	
	<b>Examiner</b> Bobby Ramdhanie, Ph.D.	<b>Art Unit</b> 1797	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 23 August 2007.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-13 & 15-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-13 and 15-22 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 21 January 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                                | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                       | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's arguments filed 08/14/2007 have been fully considered but they are not persuasive because of the following:
2. Applicant's election with traverse of Group I, Claims 1-13 & 15-22 in the reply filed on 08/14/2007 is acknowledged. The traversal is on the ground(s) that restriction of the elected claims was improper and examination could be made without serious burden. This is not found persuasive because of the following: The two inventions would require a different field of search. Claims 1-13 & 15-22, are drawn to a method of analysis of analyzing a temperature indicating paint using a marker paint, classified in class 422, subclass 56; whereas the chemical composition of the paint (Claims 23-31 are classified in a different field and would require a different search.

The requirement is still deemed proper and is therefore made FINAL.

### ***Response to Arguments***

1. In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, the motivation to

combine these references stem from the fact that all of the references all relate to paint or paints, their change in temperature, and relationship to a surface. It would have been obvious for one of ordinary skill in the art to find and combine these references in the prior art because metal, either on the outside of a ship or the inside of a metal turbine heats up and give off thermal radiation, one of which is in the form of heat. As a result, all of the references would have been found and modified accordingly to investigate how these paints change in color in their respective locations. This investigation would be part of any normal, ordinary and obvious set of experiments one of ordinary skill in the art would comprehend, do and perform. Furthermore, investigating the behavior of these coatings which prevent corrosion and debris build up the metal, would be part of the process of investigation of the coatings whether inside of a closed system such as a black box with a camera attached to it, or in the native place of where the metal is located (i.e. – inside of a gas turbine engine). In addition, all of the components are known in the cited references. The only difference is that the applicant has combined all of the “old elements” into a single method rather than having multiple methods separately.

2. In response to applicant's argument that the references used in the Rejection of Claim 1 are nonanalogous art, it has been held that a prior art reference must either be in the field of applicant's endeavor or, if not, then be reasonably pertinent to the particular problem with which the applicant was concerned, in order to be relied upon as a basis for rejection of the claimed invention. See *In re Oetiker*, 977 F.2d 1443, 24 USPQ2d 1443 (Fed. Cir. 1992). In this case, all of the references teach a method of

analyzing an irreversible temperature indicating paint on a surface. This is well within the scope and nature of the applicant's field of endeavor.

3. In response to applicant's argument that Smith does not view a marker paint or analyze the image to determine if any debris or dirt has been deposited on the marker paint; applicant acknowledges that Smith filters an image to remove unwanted information such as color caused by soot (See Reply). The fact that the image is being filtered is an act of analysis. Furthermore, Smith by using a filter to remove the color abnormalities caused by soot must have analyzed the image and the object, to determine that filtering is needed to obtain an image for further analysis of the object.

4. In response to applicant's arguments against the references individually, one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

#### ***Response to Amendment***

5. The indicated allowability of claims 15-22 is withdrawn in view of the newly discovered reference(s) to Chamberlain (US5008136). Rejections based on the newly cited reference(s) follow.

#### ***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and

the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

8. Claims 1-5, 9-12, & 15-18 are rejected over Chamberlain in view of Smith. Regarding Claim 1, Claims 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chamberlain (US5008136) in view of Smith (US6434267). Chamberlain teaches a method of analyzing a temperature indicating paint (Column 1 lines 36-48) using a marker paint (Column 1 line 37) comprising: Applying an irreversible temperature indicating paint to a component of a machine (Column 1 lines 36-40), applying a marker paint to the component of the machine, the irreversible temperature indicating paint having one or more changes of color at one or more known temperatures ((Column 1 lines 40-45), these color changes of the irreversible temperature indicating paint indicate the temperature to which different parts of the component have been subjected, the marker paint does not change color (Column 1 lines 36-40), operating the machine for a predetermined period of time such that the component of the machine reaches its operating conditions (Column 1 lines 40-45), viewing the irreversible temperature indicating temperature paint and the marker paint

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on the component to produce an image of the component (Column 1 lines 45-48), and analyzing the image of the component to determine if any debris and/or dirt has deposited on the marker paint (Column 2 lines 1-3). Chamberlain does not teach determining the amount of debris and/or dirt and analyzing the image of the irreversible temperature indicating paint to determine the temperature at different regions of the component taking into account the amount of any debris and/or dirt deposited onto the marker paint. Smith teaches a method of analyzing a thermal indicating paint taking into account the amount of debris and/or dirt and analyzing the image of the irreversible temperature indicating paint to determine the temperature at different regions of the component (Column 7 lines 17-19). It would have been obvious to one skilled in the ordinary art at the time the invention was made to modify Chamberlain with Smith because according to Chamberlain a major advantage of thermal datum markers based on metallic alloys is the conductivity of the paint/coating matrix. Thus silver (metal) as a primary alloy has the advantage of excellent conductivity whereas standard thermal paints are insulators (Column 3 lines 55-59).

9. For Claim 2, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Smith further teaches analyzing that part of the image corresponding to the irreversible temperature indicating paint (Column 1 lines 9-15 & Column 4 lines 60-70) and determining the colors of the irreversible temperature indicating paint at different positions, allocating temperatures to the colors at the different positions from a store of the known colors for that particular irreversible temperature indicating paint (Column 5 lines 0-40).

10. For Claim 3, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Smith further teaches analyzing the color of that part of the image corresponding to the irreversible temperature indicating paint and comparing the color of that part of the image corresponding to the irreversible temperature indicating paint with a stored color of the irreversible temperature indicating paint to determine if there is a difference in color (Column 2 lines 60-65). Neither Chamberlain nor Smith teaches analyzing the color of that part of the image corresponding to the marker paint by comparing the color of that part of the image corresponding to the marker paint with a stored color of the marker paint to determine if there is a difference in color. It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chamberlain and Smith to the color of that part of the image corresponding to the marker paint by comparing the color of that part of the image corresponding to the marker paint with a stored color of the marker paint to determine if there is a difference in color because according to Chamberlain, the surface of a flame sprayed coating is extremely rough causing both contamination and interpretation problems (Column 2 lines 1-3).

11. For Claim 4, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 3. Smith further teaches adjusting the temperature allocated to the different positions on the irreversible temperature indicating paint (Column 1 lines 14-17).



12. For Claim 5, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Smith further teaches viewing the component using a boroscope (Column 7 lines 40-45).

13. For Claim 9, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Smith further teaches applying a plurality of irreversible temperature indicating paints to a component, each of the irreversible temperature indicating paints having changes in colors at different temperatures to each of the other irreversible temperature indicating paints (Column 5 line 65 to Column 6 line 20).

14. For Claim 10, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Smith further teaches color-banding for the irreversible temperature indicating paint (Column 5 line 65 to Column 6 line 5).

15. For Claim 11, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Smith further teaches that the machine comprises a gas-turbine engine (Column 1 lines 14-15).

16. For Claim 12, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 11. Chamberlain further teaches the component is a turbine vane or a turbine blade (Column 1 line 63).

17. Claims 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chamberlain (US5008136) in view of Smith (US6434267). Regarding Claim 15, Chamberlain teaches a method of analyzing a temperature indicating paint (Column 1 lines 36-48) using a marker paint (Column 1 line 37) comprising: Applying an

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irreversible temperature indicating paint to a component of a machine (Column 1 lines 36-40), applying a marker paint to the component of the machine, the irreversible temperature indicating paint having one or more changes of color at one or more known temperatures ((Column 1 lines 40-45), these color changes of the irreversible temperature indicating paint indicate the temperature to which different parts of the component have been subjected, the marker paint does not change color (Column 1 lines 36-40), operating the machine for a predetermined period of time such that the component of the machine reaches its operating conditions (Column 1 lines 40-45), viewing the irreversible temperature indicating temperature paint and the marker paint on the component to produce an image of the component (Column 1 lines 45-48), analyzing the image of the component to determine if any debris and/or dirt has deposited on the marker paint (Column 2 lines 1-3) and wherein the marker paint comprises a pigment, a binder and a solvent, the pigment, wherein the marker paint comprises 42wt% to 52wt% pigment (Column 2 line 21) , 31wt% to 37wt% acrylic resin (Column 2 line 57) and 17wt% to 21 wt% silicone resin (Column 2 lines 20-23) excluding solvent. Chamberlain does not teach determining the amount of debris and/or dirt and analyzing the image of the irreversible temperature indicating paint to determine the temperature at different regions of the component taking into account the amount of any debris and/or dirt deposited onto the marker paint, nor does Chamberlain teach the method wherein the marker paint comprises cobalt titanium oxide, titanium nickel antimony oxide, cobalt aluminum oxide or cadmium sulphide selenium. Smith teaches a method of analyzing a thermal indicating paint taking into account for teach determining

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the amount of debris and/or dirt and analyzing the image of the irreversible temperature indicating paint to determine the temperature at different regions of the component (Column 7 lines 17-19). Smith does not teach the method of analyzing the image or that the marker paint comprises cobalt titanium oxide, titanium nickel antimony oxide, cobalt aluminum oxide, or cadmium sulphide selenium. It would have been obvious to one skilled in the ordinary art at the time the invention was made to modify Chamberlain with Smith because according to Chamberlain a major advantage of thermal datum markers based on metallic alloys is the conductivity of the paint/coating matrix. Thus silver (metal) as a primary alloy has the advantage of excellent conductivity whereas standard thermal paints are insulators (Column 3 lines 55-59). Examiner takes the position that cobalt titanium oxide, titanium nickel antimony oxide, cobalt aluminum oxide, or cadmium sulphide selenium all are metallic alloys and one of ordinary skill in the art would have knowledge of these two prior art references which they would be able to modify and obtain the same degree of success using in this method.

18. For Claim 16, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 15. Chamberlain further teaches an obvious variant of the marker paint which comprises 45%wt to 49%wt pigment, 32.5%wt to 35.5%wt acrylic resin, and 18%wt to 20 %wt silicone resin excluding solvent and 47%wt pigment, 34%wt acrylic resin, and 19%wt silicone resin (Column 2 line 21, line 57, and lines 20-23).

19. For Claim 17, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 16. Chamberlain further teaches an obvious variant of the

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marker paint, which comprises 47%wt pigment, 34%wt acrylic resin, and 19%wt silicone resin excluding solvent.

20. For Claim 18, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 15. Chamberlain further teaches that the binder comprises acrylic resin (Column 2 lines 20-24) and silicone resin (Column 2 lines 20-24).

21. Claims 6-8 & 13 are rejected as being unpatentable over Chamberlain, Smith, and in further in view of Bhardwaj et al (US5580172). Regarding Claim 6, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Neither Chamberlain nor Smith teaches viewing the component using a camera. Bhardwaj et al teaches this feature (Column 4 lines 21-22). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chamberlain and Smith with Bhardwaj et al because this would allow one to remove the component to be viewed from the large turbine and use a small piece of the component which would be much easier to work with.

22. For Claim 7, Chamberlain in combination with Smith and Bhardwaj et al teaches all of the claim limitations according to Claim 6. Bhardwaj et al further teaches that the camera is a digital camera (Column 4 lines 21-22).

23. For Claim 8, Chamberlain in combination with Smith and Bhardwaj et al teaches all of the claim limitations according to Claim 7. Bhardwaj et al further teaches the camera is a CCD camera (Column 4 lines 21-22).

24. For Claim 13, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 1. Neither Chamberlain nor Smith teaches viewing the

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component while the component is in the machine. Bhardwaj et al teaches this feature (Claim 1). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chamberlain and Smith with Bhardwaj et al because according to Bhardwaj et al because if the component was dismantled from the gas turbine first and then analyzed some or the debris as described in Smith, may be removed and the true amount of debris build up would not be accurately assessed.

25. Claims 19 & 20 are rejected as being unpatentable over Chamberlain, Smith and in further view of Byrd et al (US4739115). Regarding Claim 18, Chamberlain in combination with Smith teaches all of the claim limitations according to Claim 15. Chamberlain further teaches that the binder is an organic resin. Chamberlain does not teach that the organic resin is polybutyl methacrylate. Byrd et al teaches an obvious variant of polybutyl methacrylate (Column 4 lines 64-66). It would have been obvious to modify Chamberlain and Smith with Byrd et al because according to Byrd et al, these paints are applicable to aircraft components and can withstand 2000°F (Abstract).

26. For Claim 20, Chamberlain, Smith and Byrd et al teaches all of the claim limitations of Claim 18. Chamberlain further teaches that the acrylic resin comprises a high temperature silicone resin.

27. Claims 21 & 22 are rejected as being unpatentable over Chamberlain, Smith and in further view of Furuya et al (US6048910). Regarding Claim 21, Chamberlain and Smith teach all of the claim limitations according to Claim 15. Neither Chamberlain nor Smith teaches that the solvent comprises a mixture of propylene glycol ethers. Furuya et al teaches an acrylic/silicone resin paint, which contains a solvent, comprises a

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mixture of propylene glycol ether (Column 12 line 36 to Column 13 line 21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify Chamberlain and Smith with Furuya et al because according to Furuya et al these coating compositions are effectively used to protect the surface of an article (Field of Invention) and are coatings having excellent corrosion resistance and weather resistance (Prior Art) both of which are needed for the protection of metal components such as aircraft parts and especially turbines and turbine blades.

28. For Claim 22, Chamberlain, Smith, and Furuya et al teach all of the claim limitations according to Claim 21. Furuya et al further teaches that the solvent comprises a mixture of 1-methoxy-2-propanol and dipropylene glycol monoethyl ether (Column 12 line 36 to Column 13 line 21). Chamberlain, Smith, nor Furuya et al teach that the percentage of each solvent is 80 and 20 % respectively. It would have been obvious to one of ordinary skill in the art to modify Chamberlain, Smith, and Furuya et al to these given percentages with undue experimentation and still obtain the same degree of success.

**Conclusion**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Bobby Ramdhanie, Ph.D. whose telephone number is 571-270-3240. The examiner can normally be reached on Mon-Fri 8-5 (Alt Fri off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Walter Griffin can be reached on 571-272-1447. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

BR

  
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SUPERVISORY PATENT EXAMINER